BAB V
KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan dari hasil penelitian yang dilakukan dapat diperoleh kesimpulan bahwa:

Pertama, SLNs fisetin dapat dibuat menggunakan lipid golongan wax dengan metode ultrasonikasi.

Kedua, karakterisasi SLNs fisetin menghasilkan ukuran partikel range nanometer, memiliki efisiensi penjerapan terbesar sebanyak 58,4%, dan nilai zeta potensial -20,52. Formula SLNs fisetin tidak stabil selama proses penyimpanan.

Ketiga, SLNs fisetin memiliki efek antioksidan kategori sangat kuat.

B. Saran

Penelitian ini masih banyak kekurangan, maka perlu dilakukan penelitian lebih lanjut mengenai :

Pertama, perlu dilakukan analisis pengaruh surfaktan dengan menggunakan jenis surfaktan tunggal lainnya atau kombinasi.

Kedua, perlu dilakukan uji stabilitas setelah penyimpanan dalam jangka panjang selama 1 bulan.

Ketiga, perlu dilakukan uji *Transmission Electron Microscopy* (TEM) untuk mengetahui morfologi dari SLNs fisetin.

Keempat, perlu dilakukan uji disolusi untuk mengetahui kelarutan SLNs zat aktif.

DAFTAR PUSTAKA

Abdullah M, Virgus Y, Nirmin, Khairurrijal. 2008. Review: sintesis nanomaterial. *Journal nanosains & nanoteknologi*. 1, 2 33-57.

Abirami A, Halith SM, Pillai KK, Anbalagan C. 2014. Herbal Nanoparticle For Anticancer Potential-A Review. *J Of Pharm and Pharmaceu Sci*. Vol 3(8) : 2123-2132.

Anonim. 2014. *Farmakope Indonesia*. Edisi V. Jakarta: Departemen Kesehatan Republik Indonesia.

Annisa R, Hendradi E, Melani D. 2016. Pengembangan sistem nanostructured lipid carriers meloxicam dengan lipid monostearin dan miglyol 808 menggunakan metode emulsifikasi. *J. Trop. Pharm. Chem* Vol3:3:2087-7099.

Arai Y, Watanabe S, Kimira M, Shimoi K, Mochizuki R, Kinae N. 2000. Dietary mitakes of flavonols, flavones and isoflavones by Japanese women and the inverse correlation between quercetin intake and plasma LDL cholesterol concentration. *J Nutr*. 130(9):2243-2251.

Bagul US, Pisal VV, Solanki NV, Karnavat A. 2018. Current Status of Solid Lipid Nanoparticles: A Review. Mod Appl Bioequiv Availab. 3(4): 555617

Blois MS. 1958. Antioxidant determinations by the use of a stabel free radical. *Nature* 181:1199-1200.

Bothiraja C, Yojana BD, Pawar AP, Shaikh KS, Thorat UH. 2014. Fisetin-Loaded Nanocochleates: Formulation, Characterisation, In Vitro Anticancer Testing, Bioavailability and Biodistribution Study. *Original Research.* Bharati Vidyapeeth University Poone College of Pharmacy. Pane, Maharashtra. India.

Chan CC, Herma L, Lee YC, Zhang XM. 2004. *Analytical method validation and instrument performance verification*. New Jersey: Inc Publication.

Dang Y, Xie Y, Duan JZ, Ma P, Li GW, Ji G. 2014. Quantitative determination of myricetin in rat plasma by ultra performance liquid chromatography tendem mass spectrometry and its absolute bioavailability. *Drug res* 64, 516-522.

Ding Y. 2018. Lipid nanoparticles for topical delivery:solid lipid nanoparticles (SLN) & smart Llpids. Department of Biology, Chemistry and Pharmacy of Freie Universität Berlin.

Dzakwan M, Pramukantoro GE, Mauludin R, Wikarsa S. 2017. Formulation and characterization of fisetin nanosuspension. *International Journal of Pharmaceutics*. Universitas Setia Budi, Surakarta. Faculty of Pharmacy.

El-Gawad AH, Soliman OA, Shams MEE, Maria DN. 2014. Formulation and In Vitro Evaluation of Loratadine Gels for Ophthalmic Use. *RGUHS J Pharm Sci* 4.

Fajriah S, dkk. 2007. Isolasi senyawa antioksidan dari ekstrak etil asetat daun *Benalu dendropththoe pentandan L, Miq* yang tumbuh pada inang Lobi-lobi. *Jurnal Kimia Indonesia* Vol 2(1):(17-20)

Gandjar & Rohman. 2007. Kimia farmasi analisi. Pustaka Pelajar. Yogyakarta

Garud A, Singh D, Garud N. 2012. Solid lipid nanoparticles (SLN): method, characterization and applications. *International Current Pharmaceutical Journal* 1(11): 384-393.

Gordillo-galleano A, Mora-huertas CE. 2018. Solid lipid nanoparticles and nanostructured lipid carriers: A review emphasizing on particle structure and drug release. *European Journal of Pharmaceutics and Biopharmaceutics* 133:285-208.

Gowda DV, Surya Tej KVM, Moin A, Anjali, Karunakar G, Patel NP, Kamal SS. 2016. Nano structured lipid carrier based drug delivery system. Review article. *Journal of Chemical and Pharmaceutical Research*, 8(2):627-643

Gupta, RB, UB Kompella (Eds.). 2006. *Nanoparticles Technology for Drug Delivery*. Taylor & Francis Group. New York. 1-130.

Guzzo MR, Uemi M, Donate PM, Nikolaou S, H Machado AE, Okano LT. 2006. Study of the Complexation of Fisetin with Cyclodextrins. *Journal Physic Chemical* 110;10545-10551.

Harmita. (2004). Petunjuk pelaksanaan validasi metode dan cara perhitungannya. *Majalah Ilmu Kefarmasian* 1:117-135.

Jafar G, Darijanto ST, Mauludin R. 2015. Formulasi Solid Lipid Nanoparticle Ceramide. *Jurnal Pharmascience* 2:2(80-87)

Kheradmandnia S, Vasheghani-Faharani E, Nosrati M, Atyabi F. 2010. Preparation and characterization of ketoprofen-loaded solid lipid nanoparticles made from beeswax and carnauba wax. *Journal Nanomedicine :Nanotechnology, Biology, and Medicini* 6:753-759.

Kumar PP, Gayatri P, Sunil R, Jaganmohan S, Rao YM. 2012. Atorvastatin Loaded Solid lipid Nanoparticles: Formulation, Optimization, and in - vitro Characterization. *IOSR Jurnal of Pharmacy* Vol 2:Iss 5

Khan N, Syed DN, Ahmad N, Mukhtar H. 2013. Fisetin: a dietary antioxidant for health promotion. *Antioxidants and Redox Signaling* 19:2

KH Ramteke, SA Joshi, SN Dhole. 2012. Solid lipid nanoparticle: a review. *IOSR Journal of Pharmacy* Vol 2: Iss 6

Lalena JN, DA Cleary, EE Carpenter, dan NF Dean. 2008. *Inorganic material synthesis and fabrication*. Hoboken: John Willey & Sons, Inc. 211-230

Madan JR, Khude PA, Dua K. 2014. Development and evaluation of solid lipid nanoparticles of mometasone furoate for topical delivery. *International Journal of Pharmaceutical Investigation* Vol 4:iss 2

Mignet N, Seguin J, Ramos romano M, Brulle L, Touil YS, Scherman D *et al*. 2012. Development of liposomal formulation of the naturan flavonoid fisetin. *International Journal of Pharmaceutics*.

Mitri K, Shegokar R, Gohla S, Anselmi C, Muller RH. 2011. Lipid nanocarriers for dermal delivery of lutein: Preparation, characterization, stability and performance. *International Journal of Pharmaceutics* 414:267-275.

Molyneux, P. 2004. The use of the stable free radical diphenylpicryl hydrazil (DPPH) for estimating antioxidant activity. *Songklanakarin Journal Science and Technology.*

Mukherjee S, Ray S, Thakur RS. 2009. Solid lipid nanoparticles: a modern formulation approach in drug delivery system. Review article. *Indian Journal of Pharmaceutical Sciences.*

Muller RH, Mader K, Gohla S. 2000. Solid lipid nanoparticles (SLN) for controlled drug delivery-a review of the state of the art European . *J of Pharmacetics and Biopharmaceutics*. 50, 161-177

Müller RH, Moschwitzer J, dan Bushrab FN. (2006). Manufacturing Nanoparticles by Milling and Homogenization Techniques. *Nanoparticles Technology for Drug Delivery*, Taylor and Francis, New York, 21-46

Muller RH, Hommos A, Pardeike J. 2009. Lipid nanoparticles (SLN, NLC) in cosmetics and pharmaceutical dermal product. *International Journal of Pharmacetics* 366, 170-184

Mu¨ller RH, Staufenbiel S, Keck C.M. 2014. Lipid nanoparticles (SLN, NLC) for innovative consumer care & household products. H&PC Today 9(2), 18-25

Nagarajan E *et al*. 2015. Development and Evaluation of Chitosan Based Polymeric Nanoparticles of An Antiulcer Drug Lansoprazole. *Journal of Applied Pharmaceutical Science*. 5:20-25

Olawoyin R. 2018. *Nanotechnology: The future offire safety*. Safety Science 214-221

Pardeike J, Hommoss A, dan Muller R H. 2009. Lipid Nanoparticle (SLN, NLC) In Cosmetic and Pharmaceutical Derma Products. *International Journal Pharmaceutics*. 366, 170-184

Pardeshi C *et al*. 2012. Solid lipid based nanocarriers. *Acta Pharm*. 62, 433-472

Priano L *et al*. 2007. Solid lipid nanoparticles incorporating melatonin as new model for sustained oral and transdermal delivery systems. *Journal Nanoscience Nanotechnology* 7:3596-3601.

Prakash, A. 2011. Antioxidant activity. *Medallion laboratories: Analytical Progress 19(2).*

Rachmawati H *et al*. 2007. Chemical modification of interleukin-10 with mannose 6-phosphate groups yield a liver-selective cytokine. DMD 35;814-821.

Ragelle H, Sylvie CM, Johanne S, Denis B, Scherman D, Arnaud P, Chabot G. 2012. Nanoemulsion formulation of fisetin improves bioavailability and antitumor activity in mice. *Internationa Journal of Pharmaceutics*. Paris Descartes University. Faculty of Pharmacy.

Rao JP, Geckeler E.K. 2011. Polymer nanoparticles: preparation techniques and size-control parameters. *Progress in Polymer Science*. Vol 36:887-913

Ronson. 2012. *Zeta Potensial Analysis of Nanoparticles*. San Diego: Nano Composix

Rostami E *et al*. 2014. Drug Targetting Using Solid Lipid Nanoparticles. *Journal Chemistry and Physics of Lipids*.

Rowe RC, Shesky PL, dan Owen SC. (ed). 2006. *Handbook of Pharmaceutical Excipients. (5th.ed)*. London : The Pharmaceutical Press and The American Pharmacists Association. 611-616.

Salager JL. 2002. *Surfactants Type and Uses*. Universidad De Los Andes: Venezuela.

Sechi M *et al*. 2016. Nanoencapsulation of dietary flavonoid fisetin: Formulation and in vitro. *Materials Science and Engineering C* 68;594–602

Shegokar R, Muller RH. *Nanocrystal : industrially feasible multifunctional formulation technology for poorly soluble actives*. Int J Pharm. 2010, 399:222-235. 129-139

Singh R, & Lillard JW. (2009). *Experimental and Molecular Pathology*. (Vol. 86). Issue 3, 215-223.

Singhal GB, Patel RP, Prajapati BG, Patel NA. 2011. Solid lipid nanoparticles and nano lipid carriers: as a novel solid lipid based drug carrier. *International Research Journal of Pharmacy* Vol 2:40-52

Sinko, P. J. (2006). *Martin Farmasi Fisika dan Ilmu Farmasetika* (Ed. 5) (Joshita & Amalia, Penerjemah.). Jakarta: EGC, 585-587.

Sinko PJ. 2012. *Martin Farmasi Fisik dan Ilmu Farmasetika*. Jakarta: EGC. Hal 424 dan586.

Souto, EB, Wisiing S.A., Barbosa, C.M., Muller, R.H., 2004. Development of a Controlled Release Formulation Based on SLN and NLC for Topical Clotrimazole delivery. Inter J of Pharm 278: 71-77.

Souto, E.B., and Muller, R.H., 2007. Lipid Nanoparticles (Solid lipid Nanoparticles and Nanostructured Lipid Carriers) for Cosmetic, Dermal, and Transdermal Applications. Drug and Pharm Sci 166: 213-232

Subramanian P *et al*. 2015. Fisetin, a dietary flavonoid, attenuates hyperammonemia and improves circadian locomotor deficits, redox balance, and astrocytic markers in rats. *Journal of Functional Food* 12:409-419.

Suksaeree *et al*. 2014. Formulation and in vitro study of ketoprofen Pseudolatex Gel for transdermal drug delivery system. *International Journal of Pharmacy and Pharmaceutical Sciences.*

Sundarraj K, Rhagunath A, Perumal E. 2018. A review on the chemotherapeutic potential of fisetin: In vitro evidences. *Biomedicine and Pharmacotherapy Journal* 97:928-940.

Syahrizal D. 2008. Pengaruh proteksi vitamin C terhadap enzim transaminase dan gambaran histopatologis hati mencit yang dipapar plumbun. *Tesis Universitas Sumatera Utara*.

Talele P, Sahu S, Mishra AK. 2018. Physicochemical characterization of solid lipid nanoparticles comprised of glycerol monostearate and bile salts. *An International Journal Colloids and Surface B: Biointerfaces.*

Tan M-E *et al*. 2017. Development of solid lipid nanoparticles containing total flavonoid extract from Dracocephalum moldavica l. and their therapeutic effect against myocardial ischemia–reperfusion injury in rats. *International Journal of Nanomedicine*

Uner M, Yener G. 2007. Importance of *Solid lipid* Naniparticles (SLN) Various Administration Routes and Future Prespective. *International Journal of Nanomedicine* 2: 289-300.

Voigt R. 1995. *Buku Pelajaran Teknologi Farmasi*. Edisi V. Terjemahan Soendani Noerono. Yogyakarta : Gadjah Mada Univercity Press. Hal 407 dan 423

Wang D, Zhao P, Zhang C, Zhang R, Li X, Cui F. 2006. Preparation and characterization pf total flavones of hippophae rhamnoides (THF) solid lipid nanoparticles by heating-ultrasonic dispersion and lyophilization. *Asian journal of pharmaceutical sciences.*

Yadav D et al. 2011. Novel Approach: Herbal Remedies And Natural Products In Pharmaceutical Science As Nano Drug Delivery Systems. *International Journal of Pharmacy and Technology*. Vol 3(3) : 3092-3116.

Yao Y *et al*. (2013) : Preformulation Studies of Myricetin: a Natural Antioxidant Flavonoid, *Pharmazie* 69. 19-26.

Yuan H, Wang LL. Du YZ *et al.* 2007. Preparation and characteristics of nanostructured lipid carriers for control releasing progesterone by melt emulsification. *Inter J of Pharm* 60(2):174-179.

L A M P I R A N

Lampiran 1. ***Certificate of analysis*** **(COA) fisetin**

TOCRIS
a bio-techne brand

Print Date: Jan 14th 2016

Certificate of Analysis

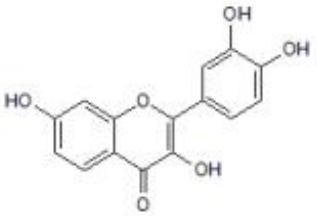
www.tocris.com

Product Name: **Fisetin** **Catalog No.: 5016** **Batch No.: 1**

CAS Number: 528-48-3

IUPAC Name: 2-(3,4-Dihydroxyphenyl)-3,7-dihydroxy-4*H*-1-benzopyran-4-one

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula:	$C_{15}H_{10}O_6$
Batch Molecular Weight:	286.24
Physical Appearance:	Yellow solid
Solubility:	DMSO to 100 mM ethanol to 10 mM
Storage:	Store at -20°C
Batch Molecular Structure:	

2. ANALYTICAL DATA

HPLC:	Shows 98.1% purity
^{1}H NMR:	Consistent with structure
Mass Spectrum:	Consistent with structure

Microanalysis:

	Carbon	Hydrogen	Nitrogen
Theoretical	62.94	3.52	
Found	62.81	3.58	

TOCRIS
a bio-techne brand

Print Date: Jan 14th 2016

Product Information

www.tocris.com

Product Name: **Fisetin** **Catalog No.: 5016** **Batch No.: 1**

CAS Number: 528-48-3

IUPAC Name: 2-(3,4-Dihydroxyphenyl)-3,7-dihydroxy-4*H*-1-benzopyran-4-one

Description:

Naturally occuring flavonoid and antioxidant. Inhibits PI 3-K, Akt, mTOR and Cdk6. Displays antiproliferative activity in prostate cancer cells. Shown to activate ERK; exhibits neuroprotective activity in Huntington's disease models. Also a DNMT1 inhibitor.

Physical and Chemical Properties:

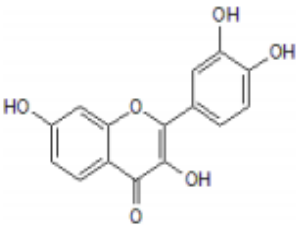
Batch Molecular Formula: $C_{15}H_{10}O_6$

Batch Molecular Weight: 286.24

Physical Appearance: Yellow solid

Minimum Purity: >98%

Batch Molecular Structure:



Storage: Store at -20°C

Solubility & Usage Info:

DMSO to 100 mM
ethanol to 10 mM

Stability and Solubility Advice:

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Information concerning product stability, particularly in solution, has rarely been reported and in most cases we can only offer a general guide. Our standard recommendations are:

SOLIDS: Provided storage is as stated on the product label and the vial is kept tightly sealed, the product can be stored for up to 6 months from date of receipt.

SOLUTIONS: We recommend that stock solutions, once prepared, are stored aliquoted in tightly sealed vials at -20°C or below and used within 1 month. Wherever possible solutions should be made up and used on the same day.

References:

Lu *et al* (2005) Crystal structure of a human cyclin-dependent kinase 6 complex with a flavonol inhibitor, fisetin. J.Med.Chem. ***48*** 737. PMID: 15689157.

Lee *et al* (2005) Mechanisms for the inhibition of DNA methyltransferases by tea catechins and bioflavonoids. Mol.Pharmacol. ***68*** 1018. PMID: 16037419.

Haddad *et al* (2010) Antiproliferative mechanisms of the flavonoids 2,2'-dihydroxychalcone and fisetin in human prostate cancer cells. Nutr.Cancer ***62*** 668. PMID: 20574928.

Maher *et al* (2011) ERK activation by the polyphenols fisetin and resveratrol provides neuroprotection in multiple models of Huntington's disease. Hum.Mol.Genet. ***20*** 261. PMID: 20952447.

Adhami *et al* (2012) Dietary flavonoid fisetin: a novel dual inhibitor of PI3K/Akt and mTOR for prostate cancer management. Biochem.Pharmacol. ***84*** 1277. PMID: 22842629.

Lampiran 2. Foto serbuk fisetin

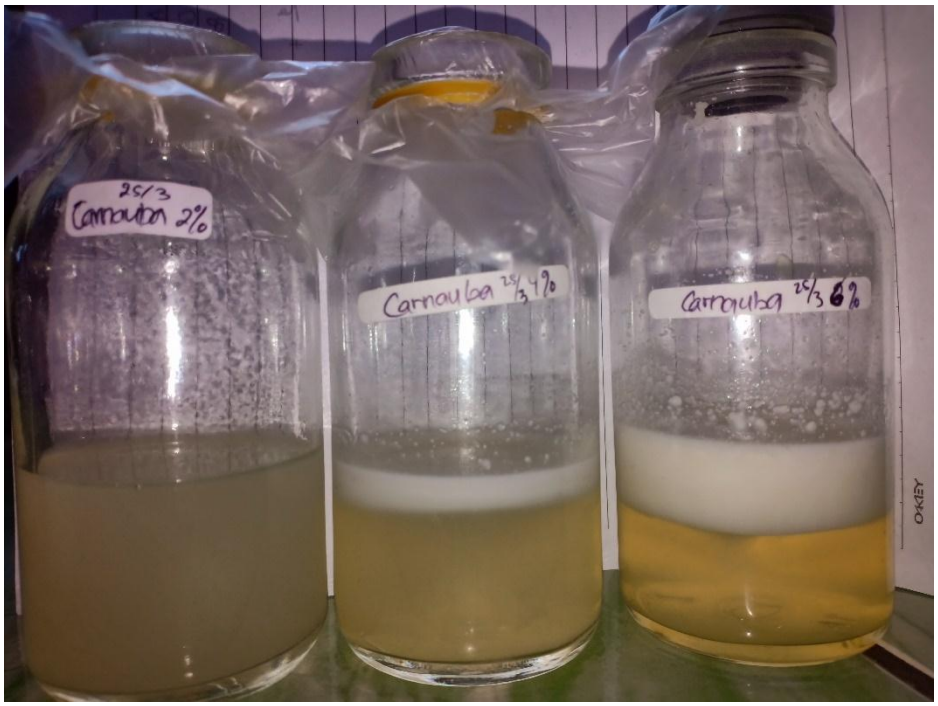
Lampiran 3. Foto *Apifil*

Lampiran 4. Emulsi SLNs Fisetin

a. Apifil

b. Polawax

c. Carnauba wax



Lampiran 5. Penentuan panjang gelombang dan pembuatan kurva baku

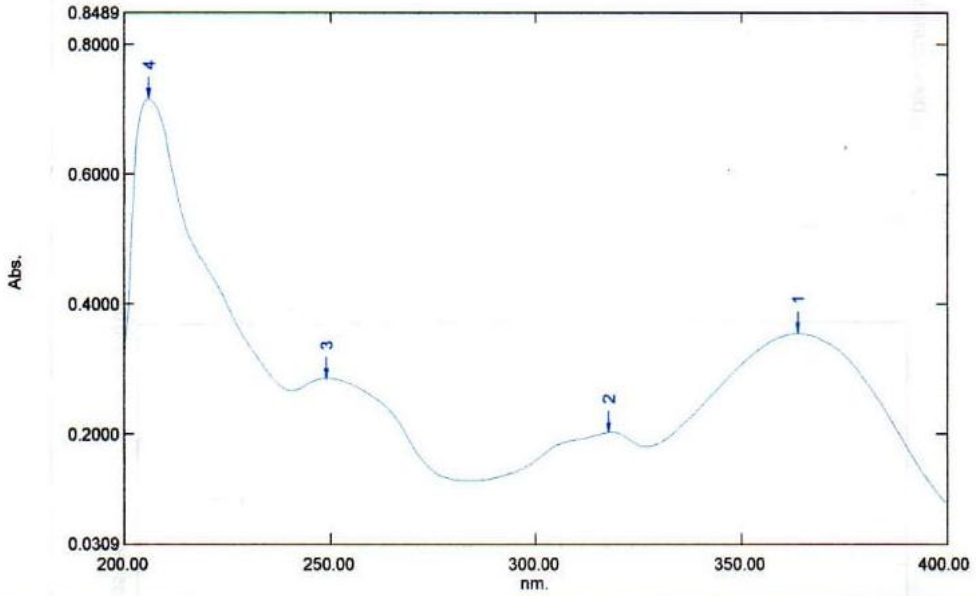
a. Penentuan panjang gelombang

Spectrum Peak Pick Report

/9 λ maks: 364 Nm

04/16/2019 08:04:23 AM

Data Set: DIAN AKURASI_080249 - RawData



No.	P/V	Wavelength	Abs.	Description
1	↑	364.00	0.3545	
2	↑	318.00	0.2021	
3	↑	249.00	0.2859	
4	↑	206.00	0.7175	
5	↓	327.00	0.1800	
6	↓	284.00	0.1279	
7	↓	241.00	0.2665	

[Measurement Properties]
Wavelength Range (nm.): 200.00 to 400.00
Scan Speed: Medium
Sampling Interval: 1.0
Auto Sampling Interval: Disabled
Scan Mode: Auto

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

b. Penentuan *operating time*

Kinetics Data Print Report

05/15/2019 03:46:21 PM

Time (Minute)	RawData ...
0.000	0.457
1.000	0.458
2.000	0.459
3.000	0.460
4.000	0.459
5.000	0.461
6.000	0.460
7.000	0.461
8.000	0.460
9.000	0.460
10.000	0.462
11.000	0.462
12.000	0.462
13.000	0.462
14.000	0.463
15.000	0.463
16.000	0.464
17.000	0.464
18.000	0.463
19.000	0.464
20.000	0.464
21.000	0.465
22.000	0.465
23.000	0.464
24.000	0.464
25.000	0.466
26.000	0.465
27.000	0.466
28.000	0.466
29.000	0.466
30.000	0.466

c. Linearitas (*Linearity*)

Konsentrasi (ppm)	Absorbansi
3,68	0,246
4,6	0,305
5,52	0,371
6,44	0,424
7,36	0,478
8,28	0,541

Hasil penimbangan fisetin

Kertas + sampel = 0,2786 g

Kertas + sisa = 0,2740 g

Zat aktif = 0,0046 g dalam 1000 ml→ x × 100 ml

= 4,6 mg dalam 1000 ml → x × 100 ml

= 46 ppm

Larutan stock 46 ppm

- 46 ppm × 0,8 ml = x × 10 ml

  x = 3,68 ppm
- 46 ppm × 1 ml = x × 10 ml

  x = 4,6 ppm
- 46 ppm × 1,2 ml = x × 10 ml

  x = 5,52 ppm
- 46 ppm × 1,4 ml = x × 10 ml

  x = 6,44 ppm
- 46 ppm × 1,6 ml = x × 10 ml

  x = 7,36 ppm
- 46 ppm × 1,8 ml = x × 10 ml

  x = 8,28 ppm

d. Penentuan Akurasi

Konsentrasi (ppm)	Absorbansi	y	Recovery (%)	Rata-rata (%)
4,6	0,308	4,624	100,5	
4,6	0,308	4,624	100,5	100,2
4,6	0,305	4,578	99,5	
5,52	0,366	5,508	99,8	
5,52	0,366	5,508	99,8	99.7
5,52	0,365	5,493	99,5	
6,44	0,429	6,469	100,4	
6,44	0,429	6,469	100,4	100,1
6,44	0,425	6,408	99,5	

% Recovery $= \frac{Kdar\ hasil\ analisis}{Kadar\ sesungguhnya}$ x 100 %

➢ **Konsentrasi 4,6 ppm**

- % Recovery = $\frac{4,624}{4,6}$ x 100 %
  = 100,5 %
- % Recovery = $\frac{4,624}{4,6}$ x 100 %
  = 100,5%
- % Recovery = $\frac{4,578}{4,6}$ x 100 %
  = 99,5%

➢ **Konsentrasi 5,52 ppm**

- % Recovery = $\frac{5,508}{5,52}$ x 100 %
  = 99,8 %
- % Recovery = $\frac{5,508}{5,52}$ x 100 %
  = 99,8%
- % Recovery = $\frac{5,493}{5,52}$ x 100 %
  = 99,5%

➢ **Konsentrasi 6,44 ppm**

- % Recovery = $\frac{6,469}{6,44}$ x 100 %

  = 100,4%

- % Recovery = $\frac{6,469}{6,44}$ x 100 %

  = 100,4%

- % Recovery = $\frac{6,408}{6,44}$ x 100 %

  = 99,5%

e. Penentuan presisi

Konsentrasi (ppm)	Absorbansi	Y
4,6	0,367	6,131
4,6	0,365	6,098
4,6	0,369	6,164
4,6	0,370	6,181
4,6	0,366	6,114
4,6	0,368	6,148
4,6	0,369	6,164
4,6	0,371	6,197
4,6	0,370	6,181
4,6	0,366	6,114
	Rata-rata	6,149
	SD	0,034
	CV	0,56%

Nilai CV dilihat dari data diatas adalah 1%, ini sesuai dengan persyaratan presisi yaitu ≤2%.

% RSD = $\frac{SD}{x}$ x 100 %

% RSD = $\frac{0,034}{6,149}$ x 100 %

= 0,56%

Lampiran 6. Hasil uji ukuran partikel formula 1

d. Replikasi 1

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 2% 1
SOP Name:	mansettings.nano
General Notes:	

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	97	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:08:34...

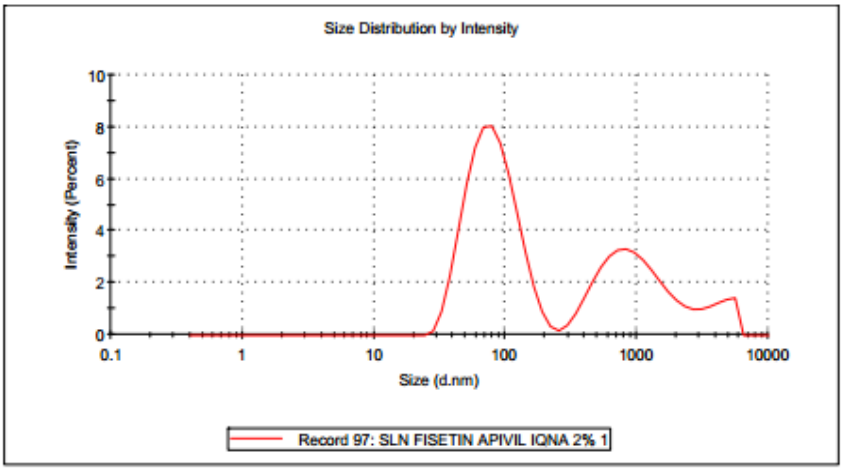
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	354.7	**Measurement Position (mm):**	4.65
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	103.8	**Peak 1:**	84.22	60.5	36.70
PdI:	0.734	**Peak 2:**	1021	32.4	571.3
Intercept:	0.911	**Peak 3:**	4112	7.1	995.2

Result quality : Refer to quality report



e. Replikasi 2

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name: SLN FISETIN APIVIL IQNA 2% 2
SOP Name: mansettings.nano
General Notes:

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	98	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:10:37...

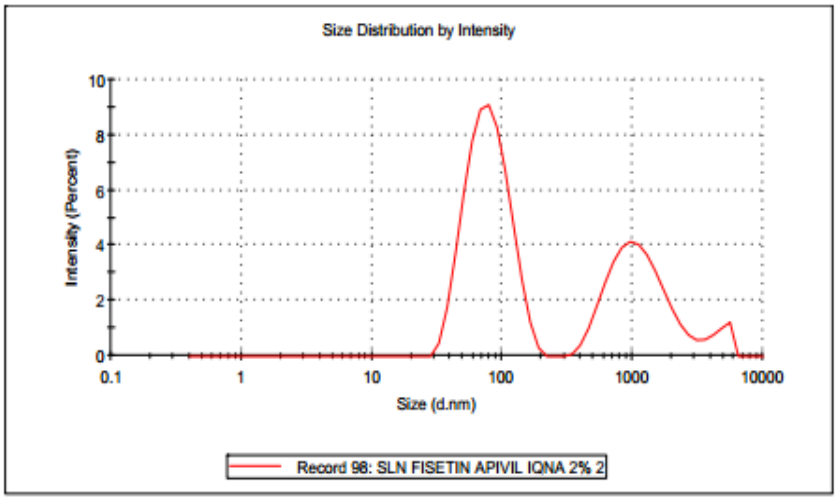
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	350.8	**Measurement Position (mm):**	4.65
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	106.2	**Peak 1:**	81.43	61.2	30.08
PdI:	0.677	**Peak 2:**	1169	34.7	571.2
Intercept:	0.916	**Peak 3:**	4489	4.2	878.4

Result quality : Good



f. Replikasi 3

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 2% 3		
SOP Name:	mansettings.nano		
General Notes:			
File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	99	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:12:41...

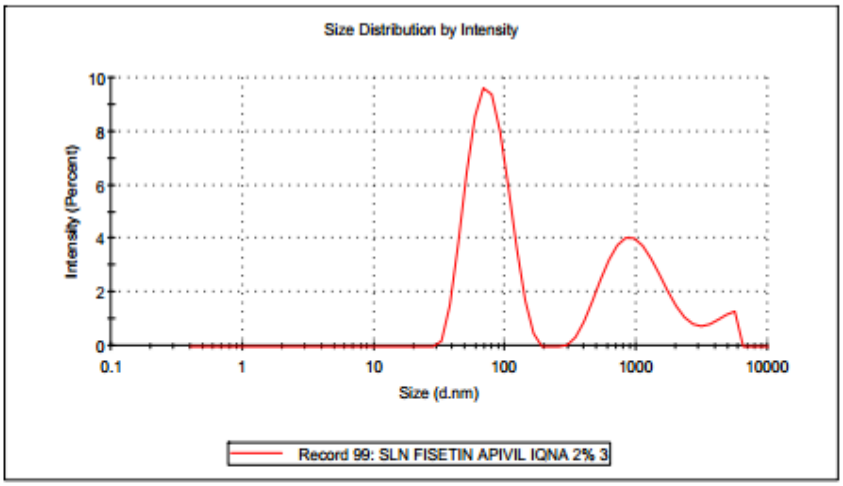
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	332.0	**Measurement Position (mm):**	4.65
Cell Description:	Disposable sizing cuvette	**Attenuator:**	5

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	105.3	**Peak 1:**	77.22	58.8	25.97
PdI:	0.684	**Peak 2:**	1106	36.2	597.0
Intercept:	0.915	**Peak 3:**	4414	5.0	873.3

Result quality : Good



Lampiran 7. Hasil uji ukuran partikel formula 2

a. Replikasi 1

Size Distribution Report by Intensity
v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 4% 1		
SOP Name:	mansettings.nano		
General Notes:			
File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	100	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:19:50...

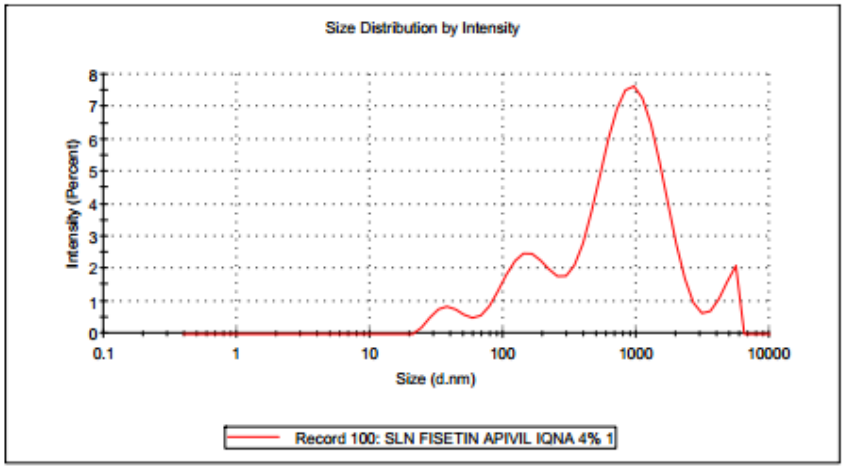
System

Temperature (°C):	25.0	**Duration Used (s):**	70
Count Rate (kcps):	189.8	**Measurement Position (mm):**	0.85
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	322.0	**Peak 1:**	1000	72.2	552.7
PdI:	1.000	**Peak 2:**	153.2	17.8	55.18
Intercept:	0.908	**Peak 3:**	4627	6.0	847.2

Result quality : Refer to quality report



b. Replikasi 2

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 4% 2
SOP Name:	mansettings.nano
General Notes:	

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	101	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:22:23...

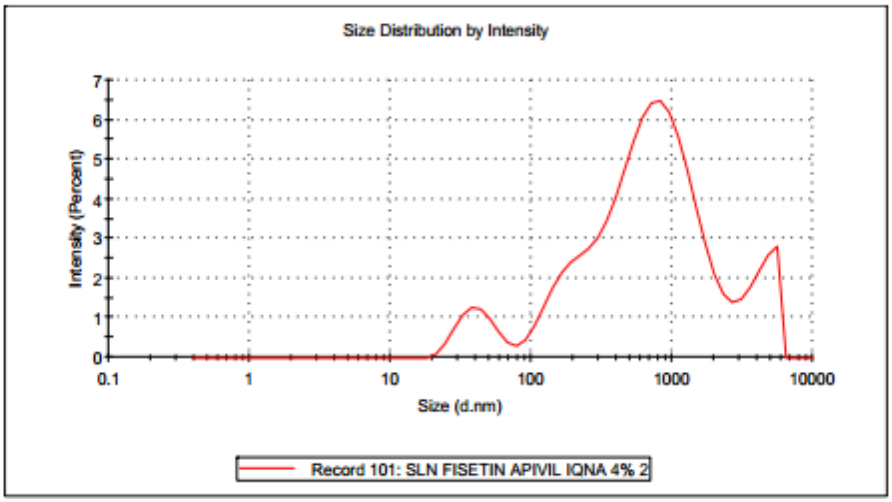
System

Temperature (°C):	25.0	**Duration Used (s):**	70
Count Rate (kcps):	190.4	**Measurement Position (mm):**	0.85
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	344.1	**Peak 1:**	793.0	80.9	566.6
PdI:	1.000	**Peak 2:**	4229	12.1	986.0
Intercept:	0.907	**Peak 3:**	43.42	7.0	13.73

Result quality : Refer to quality report



c. Replikasi 3

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 4% 3
SOP Name:	mansettings.nano
General Notes:	

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	102	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:24:58...

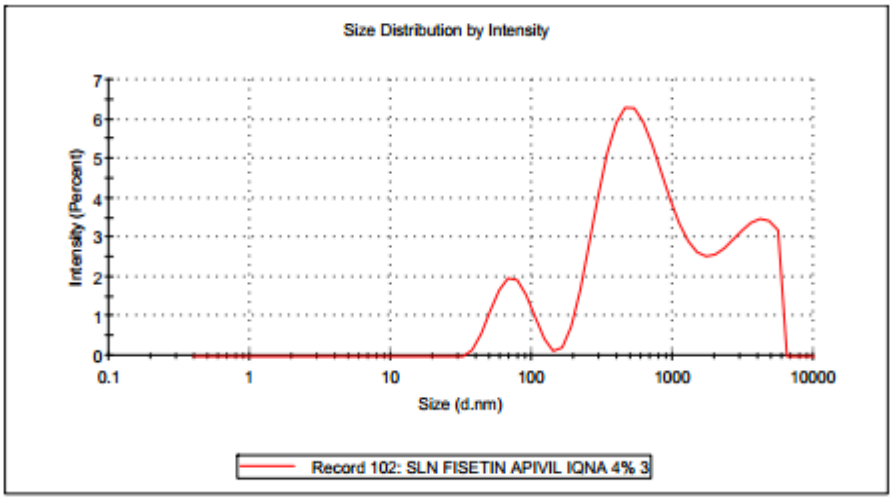
System

Temperature (°C):	25.0	**Duration Used (s):**	70
Count Rate (kcps):	194.4	**Measurement Position (mm):**	0.85
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	335.8	**Peak 1:**	674.7	63.0	389.0
PdI:	1.000	**Peak 2:**	3431	26.7	1223
Intercept:	0.910	**Peak 3:**	75.13	10.3	21.71

Result quality : Refer to quality report



Lampiran 8. Hasil uji ukuran partikel formula 3

a. Replikasi 1

Size Distribution Report by Intensity
v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 6% 1		
SOP Name:	mansettings.nano		
General Notes:			
File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	103	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:31:06...

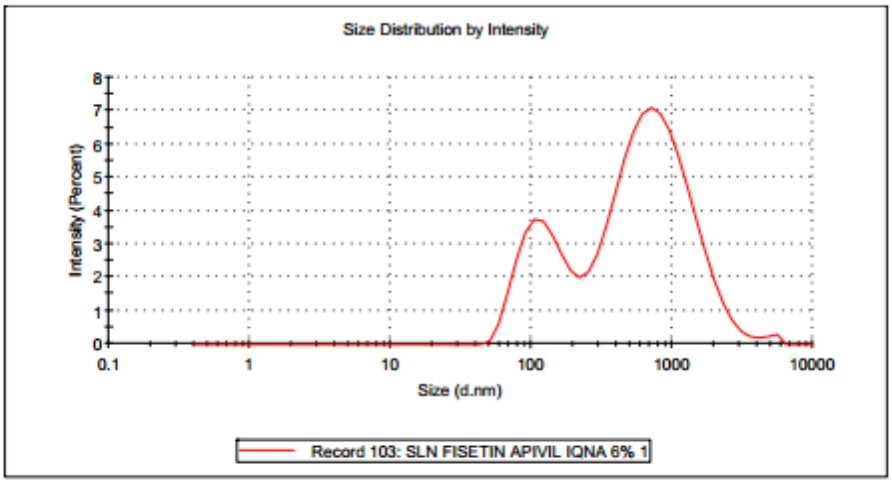
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	394.6	**Measurement Position (mm):**	1.25
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	**% Intensity:**	**St Dev (d.n...**
Z-Average (d.nm):	310.8	**Peak 1:**	869.4	74.1	568.2
PdI:	0.568	**Peak 2:**	126.8	25.2	44.67
Intercept:	0.905	**Peak 3:**	4938	0.7	576.5

Result quality : Refer to quality report



b. Replikasi 2

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name: SLN FISETIN APIVIL IQNA 6% 2
SOP Name: mansettings.nano
General Notes:

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	104	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:33:09...

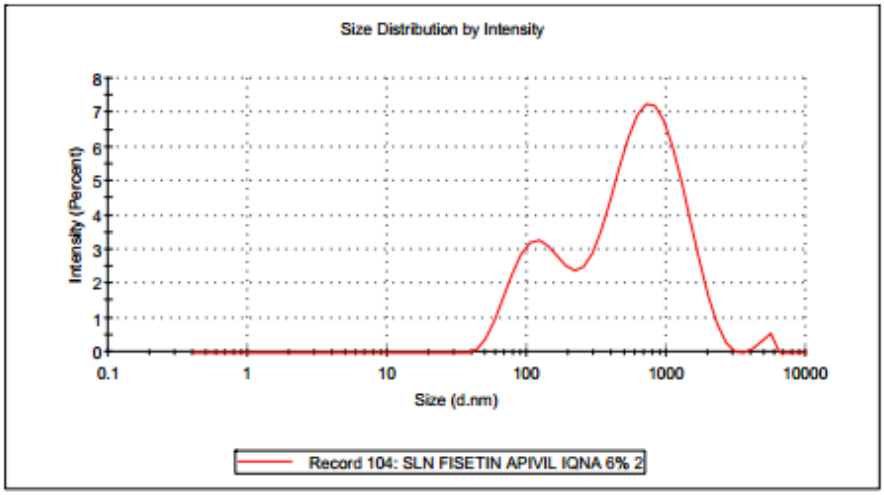
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	396.9	**Measurement Position (mm):**	1.25
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	313.5	**Peak 1:**	815.9	74.0	465.0
PdI:	0.574	**Peak 2:**	128.5	25.0	48.04
Intercept:	0.906	**Peak 3:**	5142	1.0	502.5

Result quality : Refer to quality report



c. Replikasi 3

Size Distribution Report by Intensity

v2.2

Malvern

Sample Details

Sample Name:	SLN FISETIN APIVIL IQNA 6% 3
SOP Name:	mansettings.nano
General Notes:	

File Name:	NANOFITOSOM.dts	**Dispersant Name:**	Water
Record Number:	105	**Dispersant RI:**	1.330
Material RI:	1.52	**Viscosity (cP):**	0.8872
Material Absorbtion:	0.100	**Measurement Date and Time:**	Friday, April 26, 2019 4:35:13...

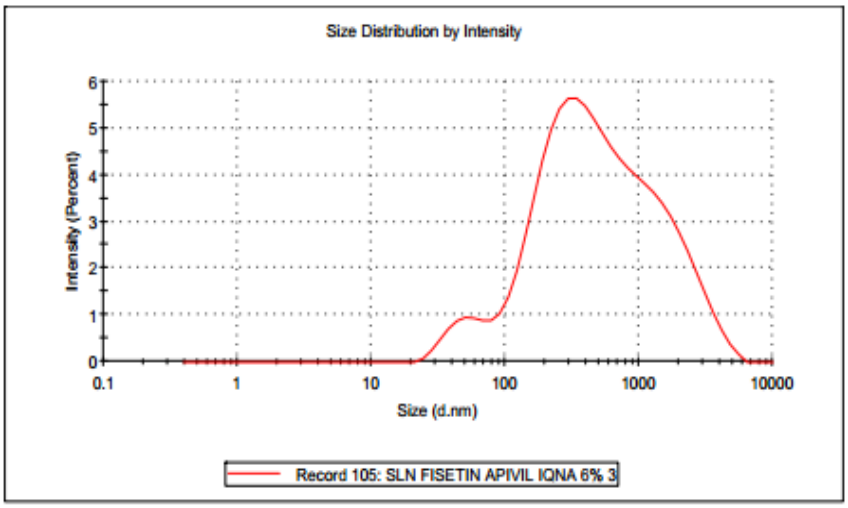
System

Temperature (°C):	25.0	**Duration Used (s):**	60
Count Rate (kcps):	388.7	**Measurement Position (mm):**	1.25
Cell Description:	Disposable sizing cuvette	**Attenuator:**	3

Results

			Size (d.nm):	% Intensity:	St Dev (d.n...
Z-Average (d.nm):	305.1	**Peak 1:**	816.6	94.9	856.7
PdI:	0.544	**Peak 2:**	49.12	5.1	12.48
Intercept:	0.898	**Peak 3:**	0.000	0.0	0.000

Result quality : Refer to quality report



Lampiran 9. Perhitungan efisiensi penjerapan SLN fisetin

Formula 1 (Apifil 2%)

- Larutan induk →200 mg SLN fisetin/10 ml etanol p.a = 20.000 ppm
- Perhitungan teoritis

  Fisetin = 10 mg

  Eksipien (tween 80+apifil) = 11000 mg

  % kadar fisetin = $\frac{10}{11000+10}$ *x* 100% = 0,091%

  Kadar dalam 200 mg SLN = 0,082% *x* 200 mg = 0,182 mg
- Perhitungan kadar fisetin terjerap menggunakan persamaan regresi linier :

  y = a + bx

  0,549 = 0,014 + 0,0636x

  x = $\frac{0,535}{0,0636}$

  x = 8,412 ppm
- % kadar = $\frac{8,412 \text{ ppm}}{20.000 \text{ ppm}}$ x 100% = 0,04206%
- Kadar dalam 200 mg SLN fisetin = 0,04206% *x* 200 mg = 0,08412 mg
- % Efisiensi penjerapan = $\frac{kadar\ terjerap}{\text{kadar teoritis}}$ x 100%

  = $\frac{0,084\ mg}{0,182 \text{ mg}}$ x 100%

  = 46,1%

Formula 2 (Apifil 4%)

- Larutan induk →100 mg SLN fisetin/10 ml etanol p.a = 10.000 ppm
- Perhitungan teoritis

  Fisetin = 10 mg

  Eksipien (tween 80+Apifil) = 12000 mg

  % kadar fisetin = $\frac{10}{12000+10}$ *x* 100% = 0,083%

  Kadar dalam 200 mg SLN = 0,079% *x* 200 mg = 0,166 mg
- Perhitungan kadar fisetin terjerap menggunakan persamaan regresi linier :

y = a + bx

0,498 = 0,014 + 0,0636x

x $= \frac{0,484}{0,0636}$

x = 7,610 ppm

- % kadar $= \frac{7,610 \text{ ppm}}{20.000 \text{ ppm}} x\ 100\%$ = 0,03805%
- Kadar dalam 200 mg SLN fisetin = 0,03805% *x* 200 mg = 0,076 mg
- % Efisiensi penjerapan $= \frac{kadar\ terjerap}{\text{kadar teoritis}} x\ 100\%$

  $= \frac{0,076\ mg}{0,166 \text{ mg}} x\ 100\%$

  = 45,8%

Formula 3 (Apifil 6%)

- Larutan induk →200 mg SLN fisetin/10 ml etanol p.a = 20.000 ppm
- Perhitungan teoritis

  Fisetin = 10 mg

  Eksipien (tween 80+Apifil) = 13000 mg

  % kadar fisetin $= \frac{10}{13000+10} x\ 100\%$ = 0,077%

  Kadar dalam 200 mg SLN = 0,075% *x* 200 mg = 0,154 mg
- Perhitungan kadar fisetin terjerap menggunakan persamaan regresi linier :

  y = a + bx

  0,588 = 0,014 + 0,0636x

  x $= \frac{0,574}{0,0636}$

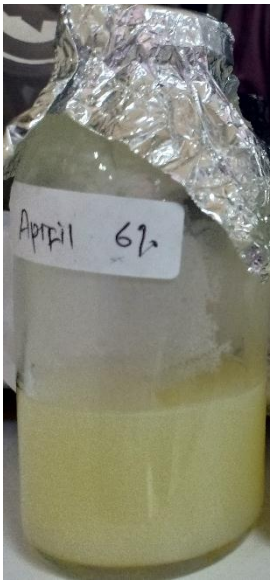
  x = 9,025 ppm
- % kadar $= \frac{9,025 \text{ ppm}}{20.000 \text{ ppm}} x\ 100\%$ = 0,045%
- Kadar dalam 200 mg SLN fisetin = 0,045% *x* 200 mg = 0,09 mg
- % Efisiensi penjerapan $= \frac{kadar\ terjerap}{\text{kadar teoritis}} x\ 100\%$

  $= \frac{0,09mg}{0,154 \text{ mg}} x\ 100\%$

  = 58,4%

Lampiran 10. Hasil Uji Stabilitas

a. Minggu pertama



b. Minggu kedua

Lampiran 11. Zeta potensial

Instrument

Serial Number:	3214-DMP
Model:	DelsaMax Pro
Pals Firmware Version:	1.1.0.6
DLS Firmware Version:	2.3.1.0
Assist Firmware Version:	1.0.0.9
Instrument Name:	BCI-3214-DMP
Laser Wavelength (nm):	532.0
Has DLS:	Yes
DLS Detector Angle (degrees):	163.5
Minimum Temperature (C):	3.5
Minimum Temperature without N2 (C):	20
Maximum Temperature (C):	70
Minimum Ramp Rate (C/min):	0
Maximum Ramp Rate (C/min):	1.5

Instrument Parameters: Measurements

Collect Data:	DLS and Pals (Simultaneous)
Acq Time (s):	20
Read Interval (s):	1
Number Acq:	3
Electric Field Frequency (Hz):	10.0
Voltage Amplitude (V):	2.5
Collection Period (s):	15.0
Auto-attenuation:	Yes
Attenuation Level (%):	0
Auto-attenuation Time Limit(s):	0
Laser Mode:	Normal
Set Temp On Connection:	No
Set Temp (C):	20
Temp Ramp Enabled:	Yes
Temp Ramp Rate (C/min):	1

Datalog Table: Measurements

	Item	Zeta Potential
		(mV)
1	Meas 1	-17.55
2	Meas 2	-18.08
3	Meas 3	-25.93
Mean		-20.52
S		4.69
%S		22.86
S^2		22.01
Min		-25.93
Max		-17.55

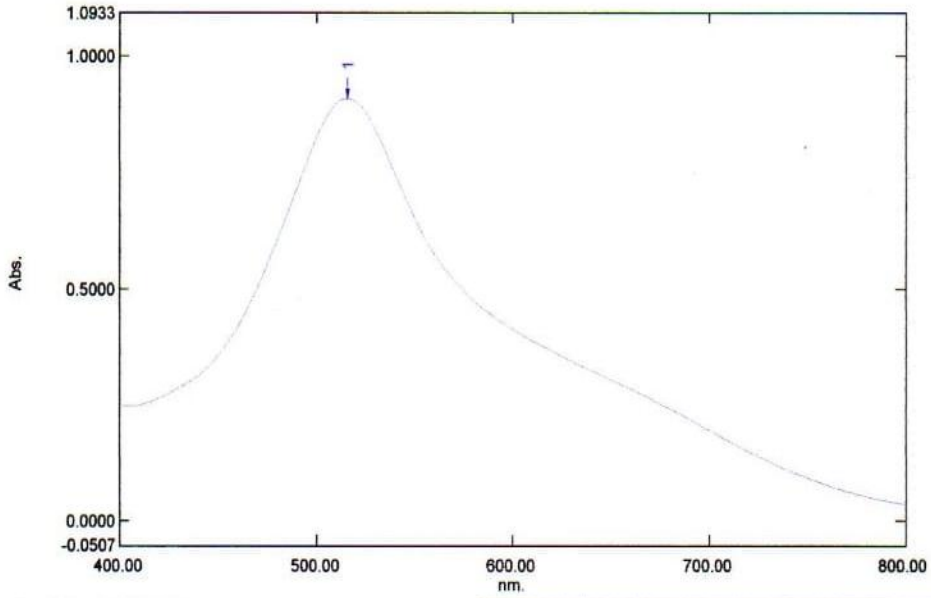
Lampiran 12. Hasil Pengujian Antioksidan

a. Penentuan panjang gelombang maksimum

Spectrum Peak Pick Report

05/10/2019 10:03:42 AM

Data Set: lamda maks dpph fix 1 - RawData



No.	P/V	Wavelength	Abs.	Description
1		516.00	0.9096	
2		405.00	0.2479	

[Measurement Properties]
Wavelength Range (nm.): 400.00 to 800.00
Scan Speed: Medium
Sampling Interval: 1.0
Auto Sampling Interval: Disabled
Scan Mode: Auto

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

Page 1 / 1

b. Penentuan *Operating Time*

OT Fisetin DPPH 4/5 19
60 MENIT

Kinetics Data Print Report

05/04/2019 12:24:22 PM

Time (Minute)	RawData ...
0.000	0.199
1.000	0.199
2.000	0.198
3.000	0.198
4.000	0.199
5.000	0.198
6.000	0.198
7.000	0.198
8.000	0.198
9.000	0.199
10.000	0.198
11.000	0.199
12.000	0.198
13.000	0.199
14.000	0.198
15.000	0.199
16.000	0.199
17.000	0.199
18.000	0.199
19.000	0.199
20.000	0.199
21.000	0.199
22.000	0.199
23.000	0.199
24.000	0.199
25.000	0.199
26.000	0.199
27.000	0.199
28.000	0.199
29.000	0.199
30.000	0.199
31.000	0.199
32.000	0.199
33.000	0.199
34.000	0.200
35.000	0.200
36.000	0.199
37.000	0.200
38.000	0.200
39.000	0.200
40.000	0.200
41.000	0.200
42.000	0.200
43.000	0.200
44.000	0.200
45.000	0.200
46.000	0.200
47.000	0.200
48.000	0.200
49.000	0.200
50.000	0.200

Kinetics Data Print Report 05/04/2019 12:24:22 PM

Time (Minute)	RawData ...
51.000	0.201
52.000	0.200
53.000	0.200
54.000	0.201
55.000	0.201
56.000	0.201
57.000	0.201
58.000	0.201
59.000	0.201
60.000	0.201

c. Penentuan %Inhibisi zat aktif

- **Zat aktif (Fisetin)**

- **Konsentrasi 15,56 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,212}{0,9096} x100\%$

%inhibisi = 76,7%

Rep. 2) %inhibisi = $\frac{0,9096-0,221}{0,9096} x100\%$

%inhibisi = 75,7%

Rep. 3) %inhibisi = $\frac{0,9096-0,224}{0,9096} x100\%$

%inhibisi = 75.4%

- **Konsentrasi 7,78 ppm**

Rep. 1) $\%\text{inhibisi} = \frac{0,9096-0,405}{0,9096} x100\%$

%inhibisi = 55,5%

Rep. 2) $\%\text{inhibisi} = \frac{0,9096-0,416}{0,9096} x100\%$

%inhibisi = 54,3%

Rep. 3) $\%\text{inhibisi} = \frac{0,9096-0,418}{0,9096} x100\%$

%inhibisi = 75.4%

- **Konsentrasi 3,89 ppm**

Rep. 1) $\%\text{inhibisi} = \frac{0,9096-0,507}{0,9096} x100\%$

%inhibisi = 44,3%

Rep. 2) $\%\text{inhibisi} = \frac{0,9096-0,509}{0,9096} x100\%$

%inhibisi = 44%

Rep. 3) $\%\text{inhibisi} = \frac{0,9096-0,511}{0,9096} x100\%$

%inhibisi = 43,8%

- **Konsentrasi 1,95 ppm**

Rep. 1) $\%\text{inhibisi} = \frac{0,9096-0,555}{0,9096} x100\%$

%inhibisi = 39%

Rep. 2) $\%\text{inhibisi} = \frac{0,9096-0,557}{0,9096} x100\%$

%inhibisi = 38,8%

Rep. 3) $\%\text{inhibisi} = \frac{0,9096-0,559}{0,9096} x100\%$

%inhibisi = 38,5%

- **Konsentrasi 0,97 ppm**

Rep. 1) $\%\text{inhibisi} = \frac{0,9096-0,578}{0,9096} x100\%$

%inhibisi = 36,5%

Rep. 2) $\%\text{inhibisi} = \frac{0,9096-0,578}{0,9096} x100\%$

%inhibisi = 36,5%

Rep. 3) %inhibisi = $\frac{0,9096-0,588}{0,9096} x100\%$

%inhibisi = 35,4%

- **Sampel Formula Apifil 6%**

- **Konsentrasi 25 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,509}{0,9096} x100\%$

%inhibisi = 44%

Rep. 2) %inhibisi = $\frac{0,9096-0,501}{0,9096} x100\%$

%inhibisi = 44,9%

Rep. 3) %inhibisi = $\frac{0,9096-0,505}{0,9096} x100\%$

%inhibisi = 44,5%

- **Konsentrasi 12,5 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,691}{0,9096} x100\%$

%inhibisi = 24%

Rep. 2) %inhibisi = $\frac{0,9096-0,695}{0,9096} x100\%$

%inhibisi = 23,6%

Rep. 3) %inhibisi = $\frac{0,9096-0,698}{0,9096} x100\%$

%inhibisi = 23,3%

- **Konsentrasi 6,25 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,796}{0,9096} x100\%$

%inhibisi = 12,5%

Rep. 2) %inhibisi = $\frac{0,9096-0,793}{0,9096} x100\%$

%inhibisi = 12,8%

Rep. 3) %inhibisi = $\frac{0,9096-0,791}{0,9096} x100\%$

%inhibisi = 13%

- **Konsentrasi 3,125 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,826}{0,9096} x100\%$

%inhibisi = 9,2%

Rep. 2) %inhibisi = $\frac{0,9096-0,827}{0,9096} x100\%$

%inhibisi = 9,1%

Rep. 3) %inhibisi = $\frac{0,9096-0,829}{0,9096} x100\%$

%inhibisi = 8,9%

- **Konsentrasi 1,56 ppm**

Rep. 1) %inhibisi = $\frac{0,9096-0,852}{0,9096} x100\%$

%inhibisi = 6,3%

Rep. 2) %inhibisi = $\frac{0,9096-0,855}{0,9096} x100\%$

%inhibisi = 6%

Rep. 3) %inhibisi = $\frac{0,9096-0,859}{0,9096} x100\%$

%inhibisi = 5,6%

Tabel Nilai IC_{50} dari Sampel fisetin

Konsentrasi (ppm)	Absorbansi			%Inhibisi		
	1	2	3	1	2	3
15,56	0,212	0,221	0,224	76,7	75.7	75,4
7,78	0,405	0,416	0,418	55.5	54.3	54
3,89	0,507	0,509	0,511	44.3	44	43,8
1,95	0,555	0,557	0,559	39	38.8	38.5
0,97	0,578	0,578	0,588	36,5	36,5	35,4

Tabel Nilai IC_{50} dari Sampel formula

Konsentrasi (ppm)	Absorbansi			%Inhibisi		
	1	2	3	1	2	3
25	0,509	0,502	0,505	76,7	75.7	75,4
12,25	0,691	0,695	0,698	55.5	54.3	54
6,25	0,796	0,793	0,791	44.3	44	43,8
3,125	0,826	0,827	0,829	39	38.8	38.5
1,56	0,852	0,855	0,859	36,5	36,5	35,4

d. Perhitungan konsentrasi (ppm)

➢ **Senyawa aktif fisetin**

50 mg/ 100 ml = 500 mg/1000ml = 500 pppm

- $V_1 \times C_1 = V_2 \times C_2$

- 500 ppm × 0,3112 ml = 10 ml × C_2

  C_2 = 15,56 ppm

- 500 ppm × 0,1556 ml = 10 ml × C_2

  C_2 =7,78 ppm

- 500 ppm × 0,0778 ml = 10 ml × C_2

  C_2 =3,89 ppm

- 500 ppm × 0,039 ml = 10 ml × C_2

  C_2 =1,95 ppm

- 500 ppm × 0,0194 ml = 10 ml × C_2

  C_2 = 0,97 ppm

➢ **Sampel formula 3**

10 mg/ 50 ml = 200 mg/1000ml = 200 pppm

- V_1 x C_1 = V_2 x C_2
- V_1 × 200 ppm = 10 ml × 25 ppm

  V_1 = 1,25 ml

- V_1 × 200 ppm = 10 ml × 12,5 ppm

  V_1 = 0,625 ml

- V_1× 200 ppm = 10 ml × 6,25 ppm

  V_1 = 0,3125 ml

- V_1× 200 ppm = 10 ml × 3,125 ppm

  V_1 = 0,156 ml

- V_1× 200 ppm = 10 ml × 1,56 ppm

  V_1 = 0,078 ml

e. Penentuan IC_{50}

Tabel Nilai IC_{50} dari Sampel fisetin

Larutan uji	Persamaan regresi	r	IC_{50} (ppm)
%inhibisi 1	Y = 33,673 + 2,770x	0,9999	5,895
%inhibisi 2	Y = 33,581 + 2,697x	0,9999	6,087
%inhibisi 3	Y = 33,018 + 2,722x	0,9999	6,240
	Rata-rata		6,074

Tabel Nilai IC_{50} dari formula

Larutan uji	Persamaan regresi	r	IC_{50} (ppm)
%inhibisi 1	Y = 3,558 + 1,616x	0,9999	28,730
%inhibisi 2	Y = 3,238 + 1,656x	0,9999	28,231
%inhibisi 3	Y = 3,086 + 1,647x	0,9999	28,483
	Rata-rata		28,482

f. Hasil Uji T-test Pengujian Peredaman Radikal DPPH

- **Sampel formula apifil 6%**

One-Sample Kolmogorov-Smirnov Test

		IC50
Normal Parameters [a,,b]	N	3
	Mean	28.48133
	Std. Deviation	.249504
Most Extreme Differences	Absolute	.175
	Positive	.175
	Negative	-.174
	Kolmogorov-Smirnov Z	.304
	Asymp. Sig. (2-tailed)	1.000

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
IC50	3	28.48133	.249504	.144051

One-Sample Test

	Test Value = 6.074					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
IC50	155.551	2	.000	22.407333	21.78753	23.02714